

SPEEDI-SLEEVE®

or how to repair shafts the easy way



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SPEEDI-SLEEVE CONCEPT

the quickest and most sensible way
to repair worn shafts

To seal efficiently, radial shaft seals must run against a smooth round surface – the seal counterface. If the counterface becomes worn, and it usually does, then the seal will no longer be able to fulfil its function, which is to retain lubricant and to exclude contaminants – solid particles, liquids as well as moisture.

Normally, the counterface will become grooved as a contaminant particle is caught under the seal lip and generates a track as the shaft rotates. As this continues, the seal will allow more particles to pass or get stuck, and seal efficiency deteriorates, eventually leading to malfunction of the component the seal is meant to protect. To rectify the situation it is necessary to repair the counterface

on the shaft – a simple seal replacement will not be sufficient.

To repair the shaft it is usually necessary to dismantle the machine in order to be able to handle the shaft and then to grind down the counterface until it is smooth again. If the grooves are deep the original size of seal will no longer fit properly – a seal with a smaller bore diameter has to be found.

Now there is an easy way to repair the counterface with the shaft still in position and without having to look for a different size of seal. The answer is the SPEEDI-SLEEVE® from CR.



Speedi-Sleeve Gold with a surface hardness between 80 and 85 HRC for heavy-duty applications.

CHARACTERISTICS

a simple idea with an impressive effect

The Speedi-Sleeve has been developed by CR – a leading seal specialist – precisely to solve the problem of worn seal counterfaces at shaft ends. It is a very thin-walled sleeve, with a near-perfect finish and hardness for its purpose, which is simply pushed in position over the worn shaft. The shaft is as good as new – if not better.

There is no shaft dismantling or machining involved – hence the “Speedi” – and costly downtime is saved. As the same size of seal as the original can be used, there is no need to search for other seals so that stock keeping is simplified and more time saved.

No special equipment is required – the installation tool is supplied with the sleeve. A mallet and a pair of tongs are all that is needed for the repair job.

How it works

The sleeve is sufficiently thin-walled (0,254 mm) to allow the same size of seal to be used. The Speedi-Sleeve is made of high quality stainless steel and has a hardness of 95 HRB. The surface is wear-resistant and machined

without directionality to a finish of $R_a = 0,25$ to $0,5 \mu\text{m}$ (depending on the size). This is, in fact, a better counterface than can normally be achieved on a shaft. If an external all-rubber V-ring is added to the sealing arrangement, there is little risk of contaminants reaching the primary seal and causing wear.

Size range

The standard range covers shaft diameters from 12 to 203 mm. Provided production quantities are viable, non-standard sizes can be produced. Because of their design, the sleeves will also fit inch-size shafts.

*Speedi-Sleeve:
good as a new shaft,
if not better.*

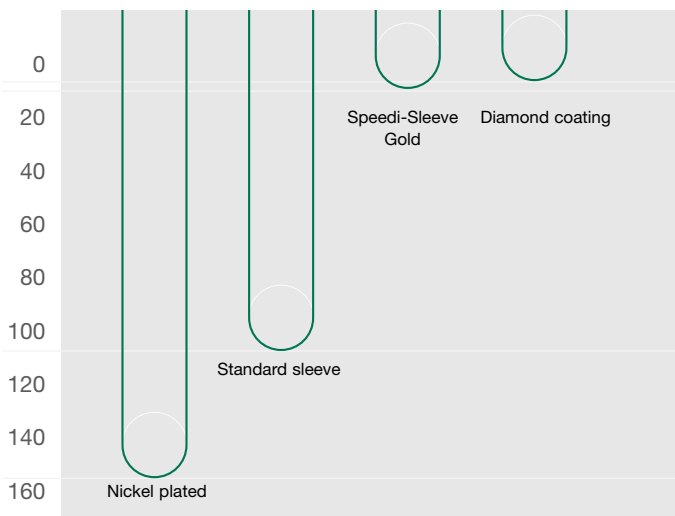


SPEEDI-SLEEVE GOLD

the preferred choice
for heavy-duty applications

Abrasion resistance

Comparison of Speedi-Sleeve Gold with various coatings



Testing in highly abrasive conditions demonstrates how the hardened surface of Speedi-Sleeve Gold resists wear.

This is a recent development and embodies all the advantages of the original Speedi-Sleeve. Speedi-Sleeve Gold is equally thin but has a surface hardness of between 80 and 85 HRC and thus is much harder than the standard sleeve. The surface is very resistant to abrasion – being almost on a par with diamond coatings. However, installation is just as easy and again the tool is supplied with the sleeve. Thus for heavy-duty applications it is the preferred choice.

Test results

The Speedi-Sleeve Gold has been thoroughly tested to ascertain its degree of abrasion resistance in severe dust environments using both coarse and fine sand. The tests were carried out at temperatures up to 100 °C and at shaft speeds of up to 8,6 m/s.

Under these conditions, seals on shafts without Speedi-Sleeve protection started to leak after 450 hours on average. Seals on Speedi-Sleeve Gold ran for an average of 2 500 hours.

In other tests, for example, it was found that continuous salt spray at 40 °C produced no trace of corrosion even after 600 hours.

Availability

Currently some 50 sizes of Speedi-Sleeve Gold are in production. These cover the majority of common shaft sizes. Other sizes (up to 200 mm) can be produced to special order subject to viability considerations. Because of their design the sleeves can also be used for inch-size shafts.

50 sizes of Speedi-Sleeve Gold are in production.
Other sizes can be produced to special order.



PROVEN PERFORMANCE

Speedi-Sleeve has solved shaft wear problems in many applications

The Speedi-Sleeve has solved shaft wear problems in thousands of applications. Here are just a few examples. It obviously pays to involve a sealing expert, not only to solve existing problems, but to propose sealing arrangements that are up to the job.

Conveyor system over-running clutch

The clutches are used to control the rollers of heavy-duty conveyors used to deliver gypsum wallboard sheets to drying ovens during the production process.

Shaft scoring occurred from lack of lubricant coupled with contamination including dust and gypsum fibres. The damaged shafts and lubricant leakage caused the lines to be shut down with resultant loss of production as well as high maintenance costs.

The sealing system was redesigned and a Speedi-Sleeve used to repair the scored shaft without any remetalising or reworking. The original braided packing was replaced by a CR “LongLife” radial shaft seal and a V-ring was added to prevent contaminants from reaching the radial shaft seal. The use of this redesigned sealing system has significantly reduced downtime and the need for maintenance.

Papermaking machine

The conditions in a paper mill are not the easiest as moisture content and dust levels are high and operating temperatures are often rather high.

The original design featured labyrinth seals. These excluded coarse particulate contamination, but were only partially successful in excluding water and airborne dust. Bearing failure was common and resulted in unacceptable levels of downtime.

Again the answer was to redesign the sealing arrangement. A Speedi-Sleeve was incorporated to protect the shaft from wear and the labyrinth was replaced by a combination of a radial shaft seal with a single lip (CRWH design) and a V-ring seal. Both seals are made of the LongLife rubber to cope with the elevated temperatures. Bearing failures were reduced so that downtime was cut and repair work minimised.

Amusement park monorail transportation

Lubricant was leaking from the monorail gearbox as the train travelled overhead through the park. As the lubricant frequently fell on park visitors, the leakage was costing park management considerable sums for cleaning clothing.

The original seal was of leather and ran on a highly polished shaft. The seal design unfortunately allowed lubricant to escape.



A combination of Speedi-Sleeve and CR seals solved the problem. The Speedi-Sleeve provided a more reliable counterface for the seals and could be installed with the shaft in place. The result is a much cleaner environment.

Hot rolling mill runout table

A rough shaft surface and contamination from the process (scale, coolant etc.) meant that seal service life was short with frequent stoppages for repairs of expensive equipment.

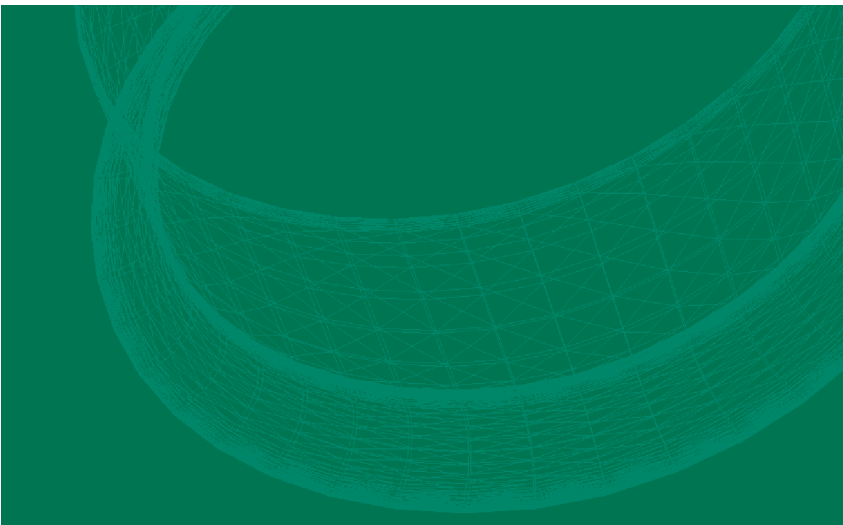
The Speedi-Sleeve came to the rescue. The sleeve was installed without having to remove the shaft and provided a proper surface finish for the CR Wavesal to run on, maximising the service life of the seal. A V-ring was also installed to provide extra protection to the primary seal.

Food processing equipment

This particular case was a poultry skinner. Poultry packaging plants use high-pressure water jets to clean their processing equipment. During this hosing down procedure some water can force its way past the seal lip, contaminating the lubricant and causing bearing corrosion. The existing seals had worn grooves in the expensive shafts.

Speedi-Sleeve were used to repair the grooved shafts without removing them from the equipment. With the addition of external V-rings, the high-pressure water was prevented from penetrating the primary seals.

To solve sealing problems call in the experts.



INSTALLATION

from scored to restored in a few minutes

Although installation is simple, it should be done carefully to achieve the best results.

Before starting, the seal seating on the shaft should be carefully cleaned and any burrs or rough spots should be filed down and polished. Deep wear grooves, scratches or very rough surfaces should be treated with a suitable metallic powder epoxy filler. The sleeve must be positioned on the shaft before the filler has hardened.

It should also be noted that although Speedi-Sleeves can be easily installed within minutes on most shafts, they should not be placed over splines or keyways etc. on the shaft. As the thin-walled sleeve has an interference fit, any disturbances on the shaft surface may create a similar pattern on the sleeve surface and the seal will leak.

Choosing the right size

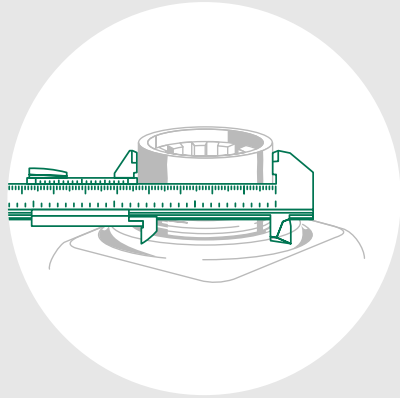
To determine the appropriate sleeve size it is first necessary to clean the shaft carefully. The diameter of an undamaged section of the seal counterface should then be measured in at least three different planes. The arithmetical mean of these measurements is used to choose a Speedi-Sleeve. If the value lies within the permissible range shown in the product table for the shaft diameter (d_a) then the Speedi-Sleeve will have an adequately tight fit on the shaft. The sleeve cannot turn on the shaft and no adhesive is required.

If no suitable sleeve is listed in the product table then it will be necessary to rework the shaft to an appropriate dimension. This will also mean that a new size of seal will be required. If production quantities are viable, CR will also make tailored sleeves.

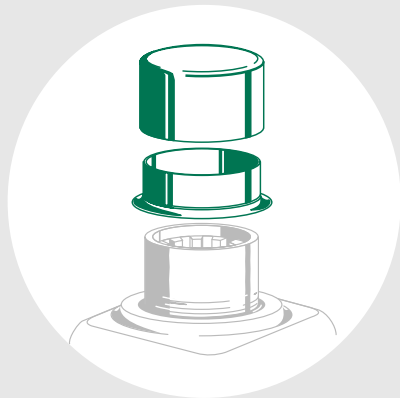
Procedure

- 1** The final position of the sleeve on the shaft should be determined and marked. The sleeve should cover the wear tracks of the old seal and not just left flush with the shaft end.
- 2** Push the sleeve on to the shaft with the flanged end first. The mounting tool supplied with the sleeve is then pushed on to the sleeve. If the tool is not long enough a length of pipe of tubing with square, deburred ends can be used instead.
- 3** Apply light mallet blows centrally to the mounting tool until the sleeve has been driven up to its final position. Be careful not to damage the outside diameter of the sleeve.





Clean and measure the diameter of the worn shaft and mark the area where the sleeve will cover the scored portion of the shaft.



Place Speedi-Sleeve on to the shaft and then place special installation tool over the sleeve.



Tap installation tool with mallet until sleeve is seated on shaft over the marked area. Remove installation tool.

4 Remove the flange if necessary. It is important that this is only done after the sleeve has reached its final position. The flange should be cut through to the tear groove after which it can be peeled off along the groove using a pair of tongs.

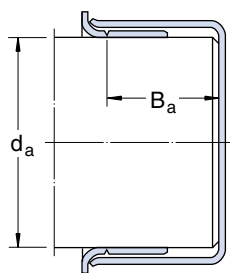
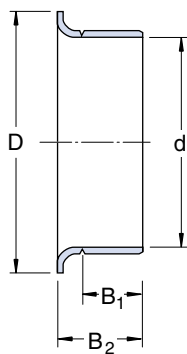
If the flange is not in the way when other parts are being assembled and if it will not foul another component in operation, it is recommended that it be left in position.

5 After the sleeve has been installed, check the shaft end again for burrs which could damage the new seal.

6 Lightly oil or grease the Speedi-Sleeve surface and, if necessary, the shaft end to ease mounting the seal. Use the same lubricant as that which the seal is to retain.

Removal

A Speedi-Sleeve can be dismantled in one of the following ways: by applying heat to the sleeve; by using a pair of wire cutters starting at or near the flange and applying a twisting action; by “peening” with a small hammer across the full width of the sleeve to expand it or, if accessible, by using a drift on the flange. A Speedi-Sleeve cannot be re-used.



Shaft diameter		Sleeve Dimensions					Designation
d _a min	max	d	D ±1,6	B ₁ ±0,8	B ₂ ±0,8	B _a ¹⁾	
mm		mm					—
11,93	12,07	12,00	15,50	6,00	8,40	47,63	CR 99049
12,65	12,75	12,70	15,50	6,40	8,70	51,00	CR 99050
13,89	14,00	14,00	19,10	6,40	9,90	46,50	CR 99055
14,22	14,38	14,30	19,10	6,40	9,90	47,00	CR 99056
14,96	15,06	15,00	19,10	5,00	9,00	47,30	CR 99059
15,82	15,92	15,88	19,10	8,00	10,30	51,00	CR 99062
15,82	15,93	15,88	19,10	8,00	10,30	50,80	CR 99810*
15,89	16,00	16,00	19,10	8,00	11,10	50,80	CR 99058
16,95	17,05	17,00	27,00	8,00	11,00	51,00	CR 99068
17,32	17,42	17,37	22,90	8,00	11,10	51,00	CR 99060
17,89	18,00	18,00	27,00	8,00	11,00	46,00	CR 99082
19,00	19,10	19,00	24,00	8,00	11,10	50,80	CR 99811*
		19,00	24,00	8,00	11,10	51,00	CR 99076
19,28	19,33	19,30	23,80	8,00	11,10	51,00	CR 99081
19,81	19,91	19,86	23,80	8,00	11,10	51,00	CR 99080
19,95	20,05	20,00	23,60	8,00	11,00	51,00	CR 99078
21,77	21,87	21,82	29,30	6,50	9,50	51,00	CR 99086
21,87	22,00	22,00	30,20	6,60	9,10	47,10	CR 99084
		22,00	30,20	8,00	12,00	46,00	CR 99085
22,17	22,27	22,23	27,80	8,00	11,10	51,00	CR 99087
22,17	22,28	22,23	27,80	8,00	11,10	50,80	CR 99812*
23,06	23,16	23,11	30,90	8,00	11,10	47,00	CR 99091
23,06	23,17	23,11	30,90	8,00	11,10	47,00	CR 99860*
23,87	24,00	24,00	28,70	8,00	11,10	50,80	CR 99092
24,54	24,64	24,59	28,70	8,00	11,10	51,00	CR 99094
		24,59	28,70	15,90	18,30	51,00	CR 99096

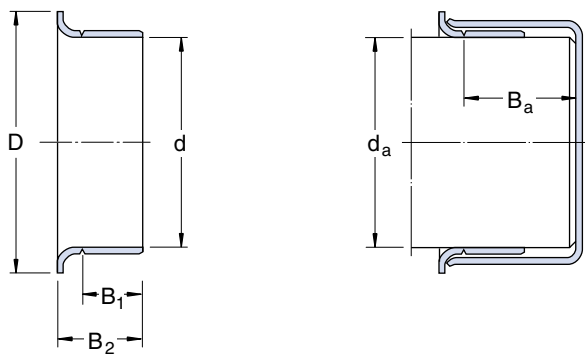
* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used

Shaft diameter		Sleeve Dimensions					Designation
d _a min	max	d	D ±1,6	B ₁ ±0,8	B ₂ ±0,8	B _a ¹⁾	
mm		mm					—
24,94	25,04	25,00	33,00	8,00	11,00	50,80	CR 99813*
24,95	25,05	25,00	33,00	8,00	11,00	51,00	CR 99098
25,35	25,45	25,40	31,00	8,00	11,10	50,80	CR 99814*
		25,40	31,00	8,00	11,10	51,00	CR 99100
25,87	26,00	26,00	33,30	8,00	12,00	46,00	CR 99103
26,92	27,03	27,00	33,50	8,00	11,10	47,00	CR 99815*
		27,00	33,50	8,00	11,00	72,00	CR 99106
27,61	27,71	27,66	35,70	8,00	11,10	16,00	CR 99108
27,94	28,04	28,00	34,90	9,50	12,70	72,00	CR 99111
28,52	28,62	28,58	38,10	8,00	11,10	17,00	CR 99816*
		28,58	38,10	8,00	11,10	17,00	CR 99112
28,53	28,63	28,58	38,10	9,50	12,70	17,50	CR 99116
29,31	29,41	29,36	34,30	9,50	12,70	17,00	CR 99120
29,79	29,92	29,85	40,00	8,00	11,10	17,00	CR 99122
29,95	30,07	30,00	35,60	8,00	11,00	17,00	CR 99114
30,10	30,22	30,15	35,60	8,00	11,00	17,00	CR 99118
30,89	31,04	31,00	39,70	8,00	11,00	16,00	CR 99123
31,42	31,57	31,50	39,10	8,00	11,10	17,00	CR 99141
31,67	31,83	31,75	38,10	8,00	11,10	18,00	CR 99817*
		31,75	38,10	8,00	11,10	18,00	CR 99125
31,92	32,08	32,00	38,00	8,00	11,10	18,00	CR 99128
33,23	33,37	33,30	40,60	6,40	9,50	21,00	CR 99129
33,28	33,42	33,35	40,50	12,70	15,90	21,00	CR 99818*
		33,35	40,50	12,70	15,90	21,00	CR 99131
33,84	34,00	34,00	41,30	12,70	15,90	20,70	CR 99134
34,82	34,98	34,90	41,60	8,00	11,10	21,00	CR 99133
		34,93	41,60	12,70	15,90	21,00	CR 99819*
		34,90	41,60	12,70	15,90	21,00	CR 99138

* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used



Shaft diameter		Sleeve Dimensions					Designation
da min	max	d	D ±1,6	B ₁ ±0,8	B ₂ ±0,8	B _a ¹⁾	
mm		mm					—
34,92	35,08	35,00	41,60	13,00	16,00	20,00	CR 99820*
		35,00	41,60	13,00	16,00	20,00	CR 99139
35,86	36,00	36,00	42,90	13,00	17,00	25,00	CR 99146
36,37	36,52	36,45	45,20	14,30	17,50	26,00	CR 99821*
		36,45	45,20	14,30	17,50	26,00	CR 99143
36,45	36,60	36,53	45,20	9,50	12,70	26,00	CR 99144
37,84	38,00	38,00	45,20	13,00	17,00	25,00	CR 99147
38,02	38,18	38,10	45,20	9,50	12,70	26,00	CR 99823*
		38,10	45,20	9,50	12,70	26,00	CR 99150
		38,10	45,20	14,30	17,50	26,00	CR 99822*
		38,10	45,20	14,30	17,50	26,00	CR 99149
38,61	38,76	38,68	47,20	11,10	14,30	26,00	CR 99152
39,35	39,49	39,42	47,20	11,10	14,30	26,00	CR 99155
39,60	39,74	39,67	47,20	14,30	17,50	26,00	CR 99824*
		39,67	47,20	14,30	17,50	26,00	CR 99156
39,77	39,93	39,85	47,20	16,00	19,10	26,00	CR 99159
39,84	40,00	40,00	46,90	9,90	12,90	25,40	CR 99153
39,92	40,08	40,00	47,00	13,00	16,00	26,00	CR 99825*
		40,00	47,00	13,00	16,00	26,00	CR 99157
40,69	40,84	40,77	49,20	12,70	16,30	25,00	CR 99160
40,84	41,00	41,00	49,20	12,70	15,90	25,80	CR 99163
41,20	41,35	41,28	47,60	8,00	11,10	26,00	CR 99161
41,21	41,35	41,28	47,60	14,30	17,50	21,00	CR 99826*
		41,28	47,60	14,30	17,50	21,00	CR 99162
41,84	42,00	42,00	53,00	11,30	14,50	21,00	CR 99166
		42,00	53,00	14,30	17,50	21,00	CR 99169
41,98	42,14	42,06	53,00	14,00	17,50	21,00	CR 99165
42,77	42,93	42,85	48,40	14,30	17,50	22,00	CR 99168
42,80	42,95	42,88	48,40	8,00	11,10	22,00	CR 99167

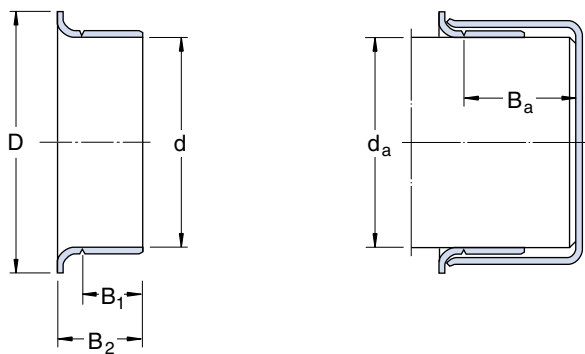
* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used

Shaft diameter		Sleeve Dimensions					Designation
d _a min	max	d	D ±1,6	B ₁ ±0,8	B ₂ ±0,8	B _a ¹⁾	
mm		mm					–
42,84	43,00	43,00	48,40	12,70	15,90	21,40	CR 99182
43,56	43,71	43,64	51,60	14,30	17,50	21,00	CR 99971
44,09	44,25	44,17	52,40	9,50	12,70	21,00	CR 99170
44,37	44,53	44,45	52,40	13,50	15,90	22,30	CR 99180
		44,45	52,40	14,30	17,50	21,00	CR 99827*
		44,45	52,40	14,30	17,50	21,00	CR 99174
		44,45	52,40	19,00	22,20	21,00	CR 99828*
		44,45	52,40	19,00	22,20	21,00	CR 99175
		44,45	52,50	9,50	12,70	21,00	CR 99172
44,73	44,87	44,80	52,40	14,30	17,50	21,00	CR 99829*
		44,80	52,40	14,30	17,50	21,00	CR 99176
44,92	45,08	45,00	53,00	14,00	17,00	21,00	CR 99830*
		45,00	53,00	14,00	17,00	21,00	CR 99177
45,16	45,31	45,24	54,00	17,20	20,30	27,00	CR 99179
45,95	46,10	46,00	53,10	14,30	17,50	26,00	CR 99181
		46,05	53,10	14,30	17,50	26,00	CR 99831*
47,17	47,32	47,24	54,80	14,30	17,50	25,00	CR 99185
47,40	47,55	47,45	55,60	22,60	26,00	25,00	CR 99186
47,55	47,70	47,63	56,00	4,50	7,50	19,00	CR 99190
		47,63	56,00	7,50	10,50	19,00	CR 99188
		47,63	56,00	9,50	13,10	27,00	CR 99184
		47,63	56,00	14,30	17,50	25,40	CR 99832*
		47,63	56,00	14,30	17,50	25,00	CR 99187
47,92	48,08	48,00	56,00	14,00	17,00	25,00	CR 99189
48,49	48,64	48,56	56,40	9,50	12,70	25,00	CR 99192
49,12	49,28	49,20	56,40	14,30	17,50	25,00	CR 99193
		49,23	56,40	14,30	17,50	25,40	CR 99833*
49,92	50,08	50,00	57,00	14,00	17,00	25,00	CR 99196
50,22	50,37	50,30	58,70	14,30	17,90	27,00	CR 99198
50,72	50,88	50,80	61,10	14,30	17,50	25,40	CR 99834*
		50,80	61,10	22,20	25,40	25,40	CR 99835*

* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used



Shaft diameter		Sleeve Dimensions					Designation
d_a min	max	d	D $\pm 1,6$	B_1 $\pm 0,8$	B_2 $\pm 0,8$	B_a ¹⁾	
mm		mm					—
50,73	50,87	50,80	61,10	14,30	17,50	25,00	CR 99199
		50,80	61,10	22,20	25,40	25,00	CR 99200
51,81	52,00	52,00	62,70	12,70	15,90	34,50	CR 99204
53,95	54,10	54,00	61,50	12,70	19,00	33,00	CR 99210
		54,00	61,50	19,80	23,80	35,00	CR 99212
		54,00	62,00	20,00	24,00	35,00	CR 99836*
54,92	55,08	55,00	62,00	20,00	23,00	32,00	CR 99215
54,92	55,09	55,00	62,00	20,00	23,00	32,00	CR 99863*
55,32	55,47	55,40	64,00	20,00	24,00	38,10	CR 99217
55,52	55,68	55,60	63,50	19,80	23,80	33,00	CR 99218
55,81	56,00	56,00	64,30	12,70	15,90	33,40	CR 99220
56,56	56,72	56,64	64,30	12,70	15,90	33,00	CR 99229
		56,64	64,30	19,80	23,00	32,00	CR 99230
56,57	56,72	56,64	64,30	12,70	15,90	33,40	CR 99861*
56,82	56,97	56,90	65,10	19,40	22,90	32,00	CR 99226
57,12	57,28	57,20	64,30	8,00	11,10	33,00	CR 99227
		57,20	64,30	19,80	23,80	33,00	CR 99225
57,13	57,28	57,15	64,30	8,00	11,10	33,40	CR 99838*
		57,15	64,30	19,80	23,80	33,40	CR 99837*
58,65	58,80	58,72	68,30	19,80	23,80	35,00	CR 99231
59,10	59,26	59,18	69,80	19,00	22,20	38,00	CR 99233
59,92	60,07	60,00	70,70	9,40	11,40	37,40	CR 99241
		60,00	70,70	20,00	23,00	35,00	CR 99235
60,25	60,40	60,33	69,90	15,10	19,10	35,00	CR 99238
60,30	60,45	60,33	69,90	19,80	23,80	35,00	CR 99839*
60,31	60,45	60,38	69,90	13,40	17,30	35,00	CR 99240
		60,38	69,90	19,80	23,80	35,00	CR 99237
61,83	61,97	61,90	71,80	19,80	23,80	35,30	CR 99243
61,81	62,00	62,00	71,80	12,70	15,90	36,20	CR 99244

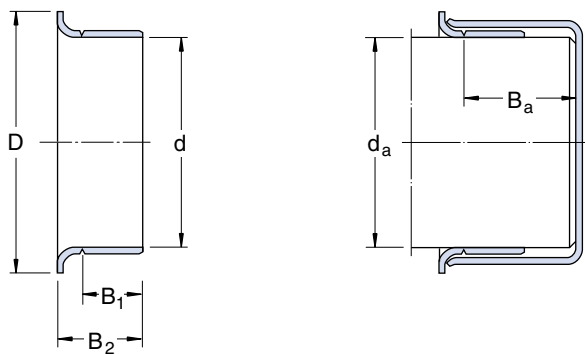
* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used

Shaft diameter		Sleeve Dimensions					Designation
d _a min	max	d	D ±1,6	B ₁ ±0,8	B ₂ ±0,8	B _a ¹⁾	
mm		mm					—
61,85	62,00	62,00	71,80	12,70	15,90	36,00	CR 99242
63,23	63,37	63,30	73,00	19,80	23,80	35,00	CR 99249
63,42	63,58	63,50	71,60	14,10	16,50	23,00	CR 99253
63,50	63,65	63,50	71,80	12,70	16,70	35,00	CR 99248
		63,50	71,60	19,80	23,80	35,00	CR 99840*
		63,50	71,60	19,80	23,80	35,00	CR 99250
63,75	63,91	63,83	71,80	19,80	23,00	37,00	CR 99251
64,92	65,08	65,00	72,40	20,00	23,00	35,00	CR 99254
64,92	65,75	65,00	72,40	20,00	23,00	35,00	CR 99841*
65,02	65,18	65,10	73,40	19,80	23,80	35,00	CR 99256
65,92	66,07	66,00	76,00	19,80	23,80	32,00	CR 99259
66,50	66,64	66,57	77,40	19,80	23,80	35,00	CR 99261
66,57	66,73	66,65	77,40	19,80	23,00	35,00	CR 99264
66,60	66,75	66,68	77,40	12,70	15,90	35,00	CR 99260
66,68	66,82	66,75	77,40	19,80	23,80	35,00	CR 99262
66,68	66,83	66,78	77,40	19,80	23,80	35,00	CR 99842*
67,81	68,00	68,00	79,40	19,10	22,20	42,90	CR 99266
69,26	69,42	69,34	79,40	19,80	23,00	33,00	CR 99268
69,60	69,74	69,67	77,90	19,80	23,80	32,00	CR 99273
69,72	69,88	69,80	79,40	19,80	23,80	32,00	CR 99843*
		69,80	79,40	19,80	23,80	32,00	CR 99274
69,77	69,93	69,85	78,10	36,50	41,30	41,00	CR 99267
69,85	70,00	70,00	79,40	19,80	23,80	32,00	CR 99844*
		70,00	79,40	19,80	23,80	32,00	CR 99275
		70,00	79,40	28,60	31,80	32,00	CR 99269
69,92	70,08	70,00	79,40	10,30	14,30	32,00	CR 99272
		70,00	79,40	20,00	24,00	32,00	CR 99276
71,35	71,50	71,42	80,90	15,10	17,50	32,00	CR 99281

* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used



Shaft diameter		Sleeve Dimensions					Designation
d_a min	max	d	D $\pm 1,6$	B_1 $\pm 0,8$	B_2 $\pm 0,8$	$B_a^{1)}$	
mm		mm					—
71,81	72,00	72,00	81,90	19,10	22,20	34,10	CR 99284
72,08	72,24	72,16	81,90	12,70	16,70	32,00	CR 99282
72,09	72,24	72,09	81,90	12,70	16,70	32,00	CR 99845*
72,80	72,94	72,87	81,00	19,80	23,80	32,00	CR 99286
72,97	73,13	73,00	81,80	19,80	23,80	32,00	CR 99846*
		73,00	81,80	19,80	23,80	32,00	CR 99287
74,60	74,75	74,68	84,90	12,70	16,30	33,00	CR 99290
		74,63	84,90	19,80	23,80	33,40	CR 99847*
		74,68	84,90	19,80	23,80	33,00	CR 99293
74,92	75,08	75,00	83,10	15,10	17,50	28,00	CR 99289
		75,00	84,00	22,00	26,00	33,00	CR 99294
75,49	75,59	75,54	82,20	20,60	25,40	32,00	CR 99292
75,95	76,10	76,00	85,10	20,60	25,40	33,00	CR 99299
		76,00	85,30	12,30	15,90	34,00	CR 99291
		76,00	85,30	14,30	17,50	35,00	CR 99298
76,12	76,28	76,20	82,30	20,60	23,80	35,00	CR 99296
76,20	76,35	76,20	82,20	20,60	25,40	32,60	CR 99848*
		76,28	82,20	20,60	25,40	33,00	CR 99300
76,20	76,40	76,28	85,00	15,90	20,60	27,00	CR 99303
76,40	76,56	76,48	85,20	12,70	15,80	51,00	CR 99301
77,81	78,00	78,00	88,10	19,50	22,20	52,30	CR 99306
79,24	79,40	79,32	89,70	17,50	20,60	51,00	CR 99311
79,25	79,40	79,38	89,70	20,60	25,40	50,80	CR 99849*
		79,32	89,70	20,60	25,40	51,00	CR 99312
79,35	79,55	79,44	89,50	14,00	18,00	52,00	CR 99307
79,81	80,01	80,00	89,90	19,10	22,50	35,00	CR 99313
79,92	80,08	80,00	90,00	11,00	15,00	35,00	CR 99317
		80,00	90,00	21,00	24,00	35,00	CR 99315
81,92	82,07	82,00	91,10	16,80	21,60	44,00	CR 99328

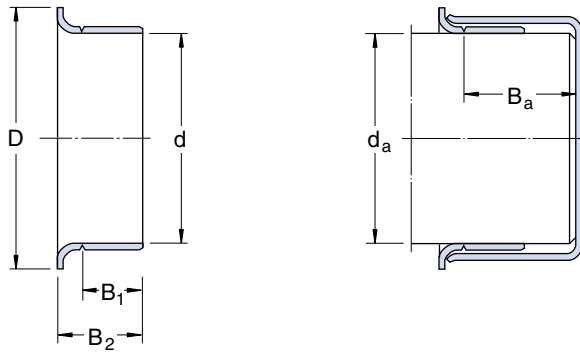
* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used

Shaft diameter		Sleeve Dimensions					Designation
d _a min	max	d	D ±1,6	B ₁ ±0,8	B ₂ ±0,8	B _a ¹⁾	
mm		mm					—
82,47	82,63	82,55	91,30	20,60	25,40	35,00	CR 99322
82,50	82,70	82,50	90,80	15,10	18,30	35,00	CR 99850*
82,55	82,70	82,63	90,80	15,10	18,30	35,00	CR 99324
82,55	82,70	82,63	91,10	17,50	22,20	32,00	CR 99326
82,55	82,70	82,55	91,10	20,60	25,40	35,00	CR 99851*
		82,63	91,10	20,60	25,40	35,00	CR 99325
84,00	84,15	84,00	93,70	20,60	25,40	35,00	CR 99331
84,76	85,02	85,00	94,00	17,00	21,00	35,00	CR 99332
84,78	85,00	85,00	93,90	10,10	12,70	36,40	CR 99334
		85,00	94,00	21,00	25,00	35,00	CR 99333
85,67	85,83	85,75	93,70	9,50	12,70	36,00	CR 99338
		85,75	93,90	20,60	25,40	35,00	CR 99337
87,25	87,40	87,33	97,60	19,80	23,00	36,00	CR 99339
88,31	88,47	88,39	97,40	19,80	23,00	36,00	CR 99340
88,82	88,98	88,98	97,60	16,00	20,60	34,20	CR 99346
88,90	89,05	89,00	97,20	8,00	12,70	34,00	CR 99347
		89,00	97,60	20,60	25,40	34,20	CR 99852*
		89,00	97,60	20,60	25,40	34,00	CR 99350
88,93	89,08	89,00	97,60	15,90	20,60	34,00	CR 99349
89,92	90,08	90,00	101,60	11,00	13,70	46,00	CR 99352
		90,00	101,60	13,40	16,90	44,00	CR 99353
		90,00	101,60	18,00	23,00	46,00	CR 99351
		90,00	101,60	23,00	28,00	44,00	CR 99354
90,42	90,58	90,50	99,10	20,60	25,40	44,00	CR 99356
91,90	92,05	92,00	102,40	20,60	25,40	44,00	CR 99360
92,02	92,18	92,10	102,20	12,70	15,90	45,00	CR 99363
		92,10	102,40	20,60	25,40	44,00	CR 99362
93,57	93,73	93,65	97,30	8,00	11,10	22,00	CR 99368
93,60	93,75	93,68	102,20	20,60	23,80	45,00	CR 99365
94,66	94,82	94,74	102,20	19,80	23,00	45,00	CR 99366

* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used



Shaft diameter		Sleeve Dimensions					Designation
da min	max	d	D ±1,6	B ₁ ±0,8	B ₂ ±0,8	B _a ¹⁾	
mm		mm					—
94,67	94,82	94,74	102,00	12,00	15,10	44,00	CR 99359
94,92	95,08	95,00	102,20	21,00	24,00	44,00	CR 99369
94,99	95,15	95,00	102,50	12,00	15,10	45,00	CR 99364
95,00	95,15	95,00	102,40	8,70	12,70	44,00	CR 99374
95,14	95,30	95,22	102,20	14,30	17,50	45,00	CR 99376
95,25	95,40	95,25	102,10	17,50	22,20	45,70	CR 99853*
95,26	95,40	95,33	102,10	17,50	22,20	48,00	CR 99372
		95,33	102,20	8,70	12,70	44,00	CR 99367
98,25	98,40	98,32	106,30	20,60	25,40	48,00	CR 99386
98,37	98,53	98,45	107,20	20,60	25,40	48,00	CR 99387
99,95	100,10	100,00	109,60	20,60	25,40	52,00	CR 99854*
		100,00	110,00	20,60	25,40	52,00	CR 99393
101,55	101,75	101,60	111,10	20,60	25,40	52,00	CR 99855*
		101,65	111,10	12,70	15,90	52,00	CR 99401
		101,65	111,10	15,20	18,40	52,00	CR 99395
		101,65	111,10	16,50	19,70	35,00	CR 99400
		101,65	111,10	20,60	25,40	52,00	CR 99399
103,90	104,10	104,00	112,70	20,00	24,00	36,00	CR 99409
104,70	104,90	104,80	113,50	20,60	25,40	35,00	CR 99412
104,90	105,10	105,00	113,50	20,00	23,20	35,00	CR 99413
106,25	106,45	106,35	114,30	20,60	25,40	35,00	CR 99418
107,34	107,54	107,44	117,10	19,80	23,00	37,00	CR 99423
107,90	108,10	108,00	117,10	20,60	25,40	37,00	CR 99424
109,78	110,00	110,00	124,90	11,40	14,50	32,90	CR 99434
109,90	110,10	110,00	125,00	12,90	16,50	32,00	CR 99435
111,00	111,20	111,00	120,70	20,60	25,40	42,00	CR 99437
111,80	112,00	112,00	120,70	19,00	22,50	27,00	CR 99438
112,62	112,83	112,72	122,20	25,40	29,00	33,00	CR 99439

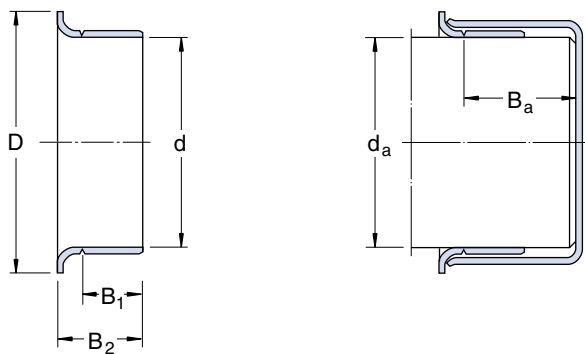
* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used

Shaft diameter		Sleeve Dimensions					Designation
d _a min	max	d	D ±1,6	B ₁ ±0,8	B ₂ ±0,8	B _a ¹⁾	
mm		mm					—
114,12	114,40	114,30	124,50	20,60	25,40	32,00	CR 99856*
114,20	114,40	114,30	124,50	20,60	25,40	32,00	CR 99450
114,90	115,10	115,00	127,00	20,60	23,80	32,00	CR 99452
117,37	117,57	117,48	128,60	25,40	31,80	35,00	CR 99463
117,37	117,58	117,48	127,00	11,10	15,80	35,00	CR 99465
119,00	119,20	119,00	128,60	20,60	25,40	35,00	CR 99468
119,90	120,10	120,00	129,80	8,00	11,00	33,00	CR 99471
		120,00	129,80	20,00	25,00	32,00	CR 99473
120,55	120,75	120,65	127,00	12,70	19,00	38,00	CR 99475
121,89	122,10	122,00	131,50	20,00	24,00	32,00	CR 99472
122,90	123,10	123,00	132,80	20,00	25,00	31,00	CR 99484
123,72	123,93	123,83	133,40	15,90	19,10	37,00	CR 99487
124,90	125,10	125,00	137,20	10,00	14,00	37,00	CR 99490
		125,00	137,20	26,00	32,00	37,00	CR 99492
126,95	127,15	127,00	137,20	13,70	17,30	37,00	CR 99501
		127,00	137,20	17,50	22,20	37,00	CR 99857*
		127,00	137,20	17,50	22,20	37,00	CR 99498
		127,00	139,90	20,60	25,40	37,00	CR 99858*
		127,00	136,90	20,60	25,40	37,00	CR 99499
129,79	130,00	130,00	139,50	19,00	24,00	30,00	CR 99494
129,98	130,18	130,00	139,50	22,00	25,30	33,00	CR 99491
130,05	130,25	130,15	139,70	20,60	25,40	32,00	CR 99513
133,25	133,45	133,35	141,20	20,60	25,40	32,00	CR 99525
134,79	135,00	135,00	149,20	20,50	25,40	32,00	CR 99533
136,42	136,62	136,53	149,20	20,60	25,40	32,00	CR 99537
138,02	138,23	138,13	146,10	38,10	42,90	48,00	CR 99548
139,00	139,20	139,00	154,90	14,30	19,10	24,00	CR 99547

* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used



Shaft diameter		Sleeve Dimensions					Designation
d_a min	max	d	D $\pm 1,6$	B_1 $\pm 0,8$	B_2 $\pm 0,8$	$B_a^{1)}$	
mm		mm					—
139,65	139,85	139,70 139,75 139,75	150,80 150,80 150,80	20,60 13,20 20,60	25,40 17,90 25,40	32,00 32,00 32,00	CR 99859* CR 99550 CR 99549
139,90	140,10	140,00	151,00	20,50	25,50	32,00	CR 99552
142,77	142,98	142,88	157,20	22,20	25,40	46,00	CR 99560
144,75	145,00	145,00	149,90	19,50	22,20	46,00	CR 99571
145,44	145,64	145,54	149,90	14,30	19,10	49,20	CR 99562
145,95	146,15	146,05	157,00	20,60	25,40	44,00	CR 99575
149,12	149,33	149,23 149,23	157,20 157,20	25,40 25,40	31,80 31,80	33,00 33,00	CR 99862* CR 99587
149,75	150,00	150,00	159,00	26,00	30,00	34,00	CR 99595
150,73	150,93	150,83	161,90	25,40	28,60	48,00	CR 99596
152,27	152,47	152,37 152,37	161,50 161,90	12,70 25,40	19,00 31,80	44,00 44,00	CR 99601 CR 99599
153,87	154,13	154,00	161,90	26,00	30,00	33,00	CR 99605
154,75	155,00	155,00	167,00	26,00	30,00	33,00	CR 99606
157,43	157,68	157,56	168,30	20,60	27,00	44,00	CR 99620
158,62	158,88	158,75	168,30	26,20	31,80	44,00	CR 99625
159,74	169,00	160,00	177,80	25,40	31,80	35,00	CR 99630
164,97	165,23	165,10	177,80	25,40	31,80	35,00	CR 99650
169,75	170,00	170,00	182,60	31,80	38,00	44,50	CR 99640
171,32	171,58	171,45	181,00	20,60	27,00	44,00	CR 99675
174,75	175,00	175,00	187,00	28,00	32,00	35,00	CR 99687
177,67	177,93	177,80	189,90	25,40	31,80	43,00	CR 99700
179,79	180,00	180,00	190,50	33,00	38,00	45,00	CR 99721
184,00	184,25	184,00	197,10	31,70	38,10	55,00	CR 99725
184,73	185,00	185,00	199,00	32,00	38,00	55,00	CR 99726

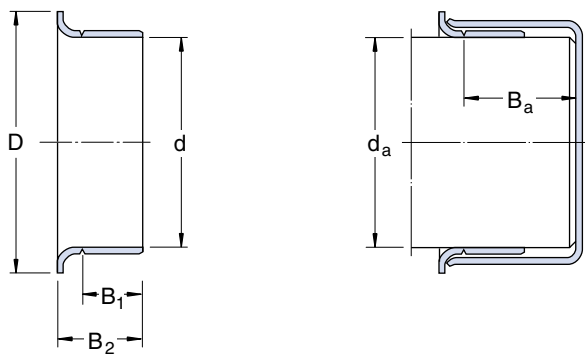
* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used

Shaft diameter		Sleeve Dimensions					Designation
d_a min	max	d	D $\pm 1,6$	B ₁ $\pm 0,8$	B ₂ $\pm 0,8$	B _a ¹⁾	
mm		mm					—
189,08	189,33	189,20	199,60	20,60	25,40	32,00	CR 99745
190,37	190,63	190,50	200,00	20,60	25,40	32,00	CR 99750
196,72	196,98	196,85	210,10	25,40	33,30	48,00	CR 99775
199,87	200,13	200,00	212,70	34,50	38,10	44,00	CR 99787
201,50	201,75	201,63	212,70	25,40	31,80	44,00	CR 99799
203,07	203,33	203,20	212,70	25,40	31,80	44,00	CR 99800

* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used



Shaft diameter		Sleeve Dimensions					Designation
d_a min	max	d	D ± 0.063	B_1 ± 0.031	B_2 ± 0.031	$B_a^{1)}$	
in		in					—
0.4690	0.475	0.472	0.610	0.236	0.331	1.875	CR 99049
0.498	0.502	0.500	0.610	0.250	0.344	2.000	CR 99050
0.547	0.551	0.551	0.752	0.251	0.389	1.831	CR 99055
0.560	0.566	0.563	0.750	0.250	0.391	1.831	CR 99056
0.589	0.593	0.591	0.750	0.197	0.354	1.862	CR 99059
0.623	0.627	0.625	0.750	0.313	0.406	2.000	CR 99810*
		0.625	0.750	0.313	0.406	2.000	CR 99062
0.624	0.630	0.630	0.752	0.315	0.437	2.000	CR 99058
0.667	0.671	0.669	1.063	0.313	0.433	2.000	CR 99068
0.682	0.686	0.684	0.900	0.313	0.438	2.000	CR 99060
0.704	0.709	0.706	1.063	0.315	0.433	1.811	CR 99082
0.748	0.752	0.750	0.945	0.313	0.438	2.000	CR 99871*
		0.750	0.945	0.313	0.438	2.000	CR 99076
0.759	0.761	0.760	0.938	0.313	0.438	2.000	CR 99081
0.780	0.784	0.781	0.935	0.313	0.438	2.000	CR 99080
0.785	0.789	0.787	0.930	0.313	0.133	2.000	CR 99078
0.857	0.861	0.859	1.155	0.250	0.375	2.000	CR 99086
0.861	0.866	0.866	1.189	0.260	0.358	1.854	CR 99084
		0.866	1.188	0.315	0.472	1.813	CR 99085
0.873	0.877	0.875	1.094	0.313	0.438	2.000	CR 99812*
		0.875	1.094	0.313	0.438	2.000	CR 99087
0.908	0.912	0.910	1.218	0.313	0.438	1.847	CR 99860*
		0.910	1.218	0.313	0.438	1.847	CR 99091
0.940	0.945	0.945	1.130	0.315	0.437	2.000	CR 99092
0.966	0.970	0.969	1.130	0.313	0.438	2.000	CR 99094
		0.969	1.130	0.625	0.719	2.000	CR 99096
0.982	0.986	0.984	1.300	0.313	0.433	2.000	CR 99813*
		0.984	1.300	0.313	0.433	2.000	CR 99098

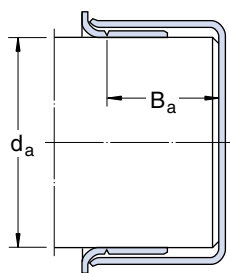
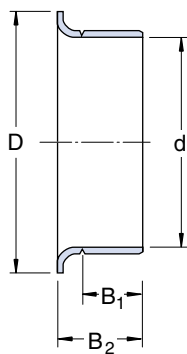
* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used

Shaft diameter		Sleeve Dimensions					Designation
d _a min	max	d	D ±0.063	B ₁ ±0.031	B ₂ ±0.031	B _a ¹⁾	
in		in					—
0.998	1.002	1.000	1.219	0.313	0.438	2.000	CR 99814*
		1.000	1.219	0.313	0.438	2.000	CR 99100
1.019	1.024	1.024	1.312	0.313	0.472	1.813	CR 99103
1.060	1.064	1.063	1.320	0.313	0.438	1.843	CR 99815*
		1.063	1.320	0.313	0.438	2.813	CR 99106
1.087	1.091	1.089	1.406	0.313	0.438	0.625	CR 99108
1.100	1.104	1.102	1.375	0.375	0.500	1.843	CR 99111
1.123	1.127	1.125	1.500	0.313	0.438	0.688	CR 99816*
		1.125	1.500	0.313	0.438	0.688	CR 99112
		1.125	1.500	0.375	0.500	0.688	CR 99116
1.154	1.158	1.156	1.350	0.375	0.500	0.688	CR 99120
1.173	1.178	1.175	1.575	0.313	0.438	0.688	CR 99122
1.179	1.184	1.181	1.400	0.315	0.433	0.688	CR 99114
1.185	1.190	1.188	1.400	0.313	0.438	0.688	CR 99118
1.216	1.222	1.219	1.563	0.313	0.433	0.625	CR 99123
1.237	1.243	1.240	1.540	0.315	0.438	0.688	CR 99141
1.247	1.253	1.250	1.500	0.313	0.438	0.688	CR 99817*
		1.250	1.500	0.313	0.438	0.688	CR 99125
1.257	1.263	1.260	1.500	0.315	0.438	0.688	CR 99128
1.308	1.314	1.313	1.600	0.250	0.375	0.813	CR 99129
1.310	1.316	1.313	1.594	0.500	0.625	0.813	CR 99818*
		1.313	1.594	0.500	0.625	0.813	CR 99131
1.332	1.339	1.339	1.625	0.500	0.625	0.815	CR 99134
1.371	1.377	1.375	1.638	0.313	0.438	0.813	CR 99133
		1.375	1.638	0.500	0.625	0.813	CR 99819*
		1.375	1.638	0.500	0.625	0.813	CR 99138
1.375	1.381	1.375	1.638	0.512	0.630	0.813	CR 99820*
		1.375	1.638	0.512	0.630	0.813	CR 99139
1.412	1.417	1.417	1.781	0.512	0.669	0.984	CR 99146

* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used



Shaft diameter		Sleeve Dimensions					Designation
da min	max	d	D ±0.063	B ₁ ±0.031	B ₂ ±0.031	B _a ¹⁾	
in		in					—
1.432	1.438	1.438	1.781	0.563	0.688	1.016	CR 99821*
		1.438	1.781	0.563	0.688	1.016	CR 99143
1.435	1.441	1.438	1.781	0.375	0.500	1.016	CR 99144
1.490	1.496	1.496	1.781	0.512	0.669	0.984	CR 99147
1.497	1.503	1.500	1.781	0.375	0.500	1.016	CR 99823*
		1.500	1.781	0.375	0.500	1.016	CR 99150
		1.500	1.781	0.563	0.688	1.016	CR 99822*
		1.500	1.781	0.563	0.688	1.016	CR 99149
1.520	1.526	1.523	1.859	0.438	0.563	1.016	CR 99152
1.549	1.555	1.552	1.859	0.438	0.563	1.016	CR 99155
1.559	1.565	1.563	1.859	0.563	0.688	1.016	CR 99824*
		1.563	1.859	0.563	0.688	1.016	CR 99156
1.566	1.572	1.569	1.859	0.625	0.750	1.016	CR 99159
1.569	1.575	1.575	1.846	0.389	0.508	1.000	CR 99153
1.572	1.578	1.578	1.850	0.512	0.630	1.023	CR 99825*
		1.578	1.850	0.512	0.630	1.023	CR 99157
1.602	1.608	1.605	1.938	0.500	0.641	1.000	CR 99160
1.608	1.614	1.614	1.937	0.500	0.625	1.016	CR 99163
1.622	1.628	1.625	1.875	0.313	0.438	1.016	CR 99161
		1.625	1.875	0.563	0.688	0.813	CR 99826*
1.623	1.628	1.625	1.875	0.563	0.688	0.813	CR 99162
1.647	1.653	1.650	2.087	0.445	0.571	0.846	CR 99166
		1.650	2.087	0.563	0.689	0.827	CR 99169
1.653	1.659	1.656	2.087	0.550	0.689	0.827	CR 99165
1.684	1.690	1.688	1.906	0.563	0.688	0.875	CR 99168
1.685	1.691	1.688	1.906	0.313	0.438	0.875	CR 99167
1.687	1.693	1.693	1.906	0.500	0.625	0.843	CR 99182
1.715	1.721	1.719	2.031	0.563	0.688	0.813	CR 99171
1.736	1.742	1.739	2.063	0.375	0.500	0.813	CR 99170

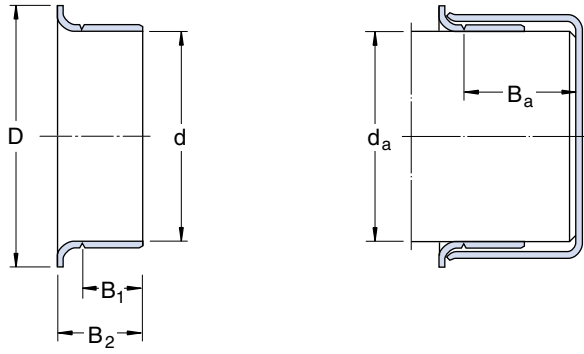
* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used

Shaft diameter		Sleeve Dimensions					Designation
d _a min	max	d	D ±0.063	B ₁ ±0.031	B ₂ ±0.031	B _a ¹⁾	
in		in					—
1.747	1.753	1.750	2.055	0.375	0.500	0.813	CR 99172
		1.750	2.063	0.531	0.625	0.875	CR 99180
		1.750	2.063	0.563	0.688	0.813	CR 9827*
		1.750	2.063	0.563	0.688	0.813	CR 99174
		1.750	2.063	0.750	0.875	0.813	CR 99828*
		1.750	2.063	0.750	0.875	0.813	CR 99175
1.761	1.767	1.766	2.063	0.563	0.688	0.813	CR 99829*
		1.766	2.063	0.563	0.688	0.813	CR 99176
1.769	1.775	1.772	2.087	0.551	0.669	0.812	CR 99830*
		1.772	2.087	0.551	0.669	0.813	CR 99177
1.778	1.784	1.781	2.125	0.675	0.800	1.062	CR 99179
1.809	1.815	1.813	2.090	0.563	0.688	1.000	CR 99831*
		1.813	2.090	0.563	0.688	1.000	CR 99181
1.857	1.863	1.859	2.156	0.563	0.688	1.000	CR 99185
1.866	1.872	1.868	2.188	0.889	1.025	1.000	CR 99186
1.872	1.878	1.875	2.203	0.175	0.295	0.744	CR 99190
		1.875	2.203	0.295	0.415	0.744	CR 99188
		1.875	2.203	0.375	0.516	1.050	CR 99184
		1.875	2.203	0.563	0.688	1.000	CR 99832*
		1.875	2.203	0.563	0.688	1.000	CR 99187
1.887	1.893	1.891	2.205	0.551	0.668	0.984	CR 99189
1.909	1.915	1.912	2.219	0.375	0.500	1.000	CR 99192
1.934	1.940	1.938	2.219	0.563	0.688	1.000	CR 99833*
		1.938	2.219	0.563	0.688	1.000	CR 99193
1.965	1.971	1.969	2.244	0.551	0.668	0.984	CR 99196
1.977	1.983	1.980	2.313	0.563	0.704	1.050	CR 99198
1.997	2.003	2.000	2.406	0.563	0.688	1.000	CR 99199
		2.000	2.406	0.563	0.688	1.006	CR 99834*
		2.000	2.406	0.875	1.000	1.000	CR 99835*
		2.000	2.406	0.875	1.000	1.000	CR 99200
2.040	2.047	2.047	2.469	0.500	0.625	1.358	CR 99204
2.057	2.063	2.063	2.469	0.813	0.938	1.375	CR 99205

* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used



Shaft diameter		Sleeve Dimensions					Designation
d_a min	max	d	D ± 0.063	B_1 ± 0.031	B_2 ± 0.031	B_a ¹⁾	
in		in					—
2.123	2.128	2.125	2.422	0.500	0.750	1.281	CR 99210
2.124	2.130	2.125	2.422	0.781	0.938	1.375	CR 99836*
		2.125	2.422	0.781	0.938	1.375	CR 99212
2.162	2.169	2.165	2.441	0.787	0.905	1.250	CR 99863*
2.162	2.168	2.165	2.441	0.787	0.905	1.250	CR 99215
2.178	2.184	2.181	2.500	0.781	0.938	1.500	CR 99217
2.186	2.192	2.188	2.500	0.781	0.938	1.313	CR 99218
2.198	2.205	2.205	2.531	0.500	0.625	1.315	CR 99220
2.227	2.233	2.230	2.531	0.500	0.625	1.313	CR 99861*
		2.230	2.531	0.500	0.625	1.313	CR 99229
		2.230	2.531	0.781	0.906	1.250	CR 99230
2.237	2.243	2.240	2.563	0.764	0.900	1.250	CR 99226
2.249	2.255	2.250	2.531	0.313	0.438	1.313	CR 99838*
		2.250	2.531	0.313	0.438	1.313	CR 99227
		2.250	2.531	0.781	0.938	1.313	CR 99837*
		2.250	2.531	0.781	0.938	1.313	CR 99225
2.309	2.315	2.313	2.688	0.781	0.938	1.375	CR 99231
2.327	2.333	2.328	2.750	0.750	0.875	1.500	CR 99233
2.359	2.365	2.362	2.785	0.370	0.450	1.471	CR 99241
		2.362	2.785	0.787	0.905	1.375	CR 99235
2.372	2.378	2.375	2.750	0.594	0.750	1.375	CR 99238
2.374	2.380	2.375	2.750	0.526	0.683	1.375	CR 99240
		2.375	2.750	0.781	0.938	1.375	CR 99839*
		2.375	2.750	0.781	0.938	1.375	CR 99237
2.434	2.440	2.438	2.828	0.781	0.938	1.393	CR 99243
2.435	2.441	2.438	2.828	0.500	0.625	1.425	CR 99242
2.433	2.441	2.441	2.827	0.500	0.625	1.425	CR 99244
2.489	2.495	2.492	2.875	0.781	0.938	1.393	CR 99249
2.497	2.503	2.500	2.820	0.555	0.650	0.890	CR 99253

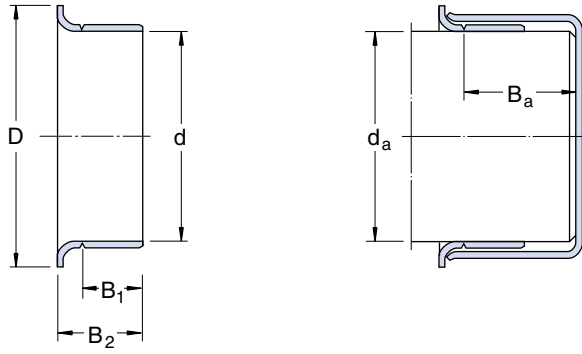
* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used

Shaft diameter		Sleeve Dimensions					Designation
d _a min	max	d	D ±0.063	B ₁ ±0.031	B ₂ ±0.031	B _a ¹⁾	
in		in					—
2.500	2.506	2.500	2.820	0.781	0.938	1.375	CR 99840*
		2.500	2.820	0.781	0.938	1.375	CR 99250
		2.500	2.828	0.500	0.656	1.393	CR 99248
2.510	2.516	2.516	2.828	0.781	0.906	1.438	CR 99251
2.556	2.562	2.559	2.850	0.787	0.905	1.375	CR 99841*
		2.559	2.850	0.787	0.905	1.375	CR 99254
2.560	2.566	2.563	2.891	0.781	0.938	1.375	CR 99256
2.595	2.601	2.598	2.990	0.781	0.938	1.250	CR 99259
2.618	2.624	2.621	3.047	0.781	0.938	1.375	CR 99261
2.621	2.627	2.625	3.047	0.781	0.906	1.375	CR 99264
2.622	2.628	2.625	3.047	0.500	0.625	1.375	CR 99260
2.625	2.631	2.625	3.047	0.781	0.938	1.375	CR 99842*
		2.625	3.047	0.781	0.938	1.375	CR 99262
2.670	2.677	2.677	3.126	0.752	0.874	1.689	CR 99266
2.727	2.733	2.730	3.125	0.781	0.906	1.313	CR 99268
2.740	2.746	2.743	3.065	0.781	0.938	1.250	CR 99273
2.745	2.751	2.750	3.125	0.781	0.938	1.250	CR 99274
2.747	2.753	2.750	3.075	1.438	1.625	1.625	CR 99267
2.750	2.756	2.750	3.125	0.406	0.563	1.250	CR 99272
		2.750	3.125	0.781	0.938	1.250	CR 99844*
		2.750	3.125	0.781	0.938	1.250	CR 99275
		2.750	3.125	1.125	1.250	1.313	CR 99269
2.745	2.751	2.750	3.125	0.781	0.938	1.250	CR 99843*
2.753	2.759	2.756	3.125	0.787	0.945	1.250	CR 99276
2.809	2.815	2.813	3.188	0.594	0.688	1.250	CR 99281
2.827	2.835	2.835	3.224	0.752	0.874	1.343	CR 99284
2.838	2.844	2.838	3.225	0.500	0.656	1.250	CR 99845*
		2.844	3.225	0.500	0.656	1.250	CR 99282
2.866	2.872	2.869	3.188	0.781	0.938	1.250	CR 99286

* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used



Shaft diameter		Sleeve Dimensions					Designation
da min	max	d	D ±0.063	B ₁ ±0.031	B ₂ ±0.031	B _a ¹⁾	
in		in					—
2.873	2.879	2.875	3.219	0.781	0.938	1.250	CR 99846*
		2.875	3.219	0.781	0.938	1.250	CR 99287
2.937	2.943	2.938	3.344	0.500	0.641	1.331	CR 99290
		2.938	3.344	0.781	0.938	1.313	CR 99847*
		2.938	3.344	0.781	0.938	1.313	CR 99293
2.950	2.956	2.953	3.273	0.594	0.688	1.083	CR 99289
		2.953	3.305	0.866	1.024	1.313	CR 99294
2.972	2.976	2.974	3.235	0.813	1.000	1.250	CR 99292
2.990	2.996	2.993	3.350	0.813	1.000	1.281	CR 99299
		2.993	3.359	0.484	0.625	1.331	CR 99291
		2.993	3.359	0.563	0.688	1.375	CR 99298
2.997	3.003	3.000	3.240	0.813	0.938	1.375	CR 99296
3.000	3.006	3.000	3.235	0.813	1.000	1.281	CR 99848*
		3.000	3.235	0.813	1.000	1.281	CR 99300
		3.000	3.345	0.625	0.813	1.063	CR 99303
3.008	3.014	3.011	3.355	0.500	0.625	2.000	CR 99301
3.063	3.071	3.071	3.469	0.770	0.874	2.059	CR 99306
3.120	3.126	3.125	3.531	0.688	0.813	2.000	CR 99311
		3.125	3.531	0.813	1.000	2.000	CR 99312
		3.125	3.531	0.813	1.000	2.000	CR 99849*
3.124	3.132	3.125	3.525	0.551	0.709	2.031	CR 99307
3.142	3.150	3.146	3.540	0.750	0.886	1.375	CR 99313
3.146	3.153	3.150	3.543	0.433	0.591	1.375	CR 99317
		3.150	3.543	0.827	0.945	1.375	CR 99315
3.225	3.231	3.228	3.585	0.660	0.848	1.750	CR 99328
3.250	3.256	3.250	3.575	0.595	0.719	1.375	CR 99850*
		3.250	3.575	0.595	0.719	1.375	CR 99324
		3.250	3.585	0.688	0.875	1.250	CR 99326
		3.250	3.585	0.813	1.000	1.375	CR 99851*
		3.250	3.585	0.813	1.000	1.375	CR 99325
3.247	3.253	3.250	3.594	0.813	1.000	1.375	CR 99322
3.307	3.313	3.310	3.688	0.813	1.000	1.375	CR 99331

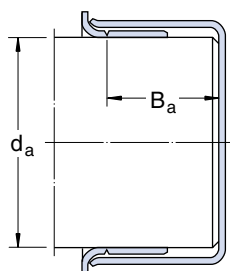
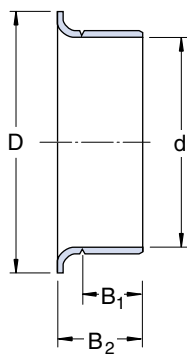
* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used

Shaft diameter		Sleeve Dimensions					Designation
d_a min	max	d	D ± 0.063	B_1 ± 0.031	B_2 ± 0.031	B_a ¹⁾	
in		in					–
3.337	3.347	3.342	3.700	0.669	0.827	1.378	CR 99332
		3.342	3.700	0.827	0.984	1.378	CR 99333
3.338	3.346	3.346	3.697	0.398	0.500	1.433	CR 99334
3.373	3.379	3.375	3.688	0.375	0.500	1.410	CR 99338
		3.375	3.695	0.813	1.000	1.375	CR 99337
3.435	3.441	3.438	3.844	0.781	0.906	1.406	CR 99339
3.477	3.483	3.480	3.835	0.781	0.906	1.406	CR 99340
3.497	3.503	3.500	3.844	0.625	0.813	1.347	CR 99346
3.500	3.506	3.500	3.825	0.313	0.500	1.347	CR 99347
		3.500	3.844	0.813	1.000	1.347	CR 99852*
		3.500	3.844	0.813	1.000	1.347	CR 99350
3.501	3.507	3.504	3.844	0.625	0.813	1.348	CR 99349
3.540	3.546	3.543	4.000	0.434	0.538	1.813	CR 99352
		3.543	4.000	0.526	0.667	1.750	CR 99353
		3.543	4.000	0.710	0.906	1.813	CR 99351
		3.543	4.000	0.906	1.102	1.750	CR 99354
3.560	3.566	3.563	3.900	0.813	1.000	1.750	CR 99356
3.618	3.624	3.621	4.031	0.813	1.000	1.750	CR 99360
3.623	3.629	3.625	4.025	0.500	0.625	1.750	CR 99363
		3.625	4.031	0.813	1.000	1.750	CR 99362
3.684	3.690	3.688	3.830	0.313	0.438	0.875	CR 99368
3.685	3.691	3.688	4.025	0.813	0.938	1.750	CR 99365
3.727	3.733	3.730	4.016	0.469	0.594	1.719	CR 99359
		3.730	4.025	0.781	0.906	1.750	CR 99366
3.737	3.743	3.740	4.025	0.827	0.945	1.750	CR 99369
3.740	3.746	3.743	4.031	0.344	0.500	1.750	CR 99374
		3.743	4.035	0.469	0.594	1.750	CR 99364
3.746	3.752	3.750	4.025	0.563	0.688	1.750	CR 99376

* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used



Shaft diameter		Sleeve Dimensions					Designation
da min	max	d	D ±0.063	B ₁ ±0.031	B ₂ ±0.031	B _a ¹⁾	
in		in					—
3.750	3.756	3.750	4.025	0.344	0.500	1.750	CR 99367
		3.750	4.020	0.688	0.875	1.800	CR 99853*
		3.750	4.020	0.688	0.875	1.875	CR 99372
3.868	3.874	3.871	4.185	0.813	1.000	1.875	CR 99386
3.873	3.879	3.875	4.219	0.813	1.000	1.875	CR 99387
3.935	3.941	3.938	4.313	0.813	1.000	2.050	CR 99854*
		3.938	4.313	0.813	1.000	2.050	CR 99393
3.998	4.006	4.000	4.375	0.500	0.625	2.066	CR 99401
		4.000	4.375	0.600	0.725	2.050	CR 99395
		4.000	4.375	0.650	0.775	1.375	CR 99400
		4.000	4.375	0.813	1.000	2.050	CR 99855*
		4.000	4.375	0.813	1.000	2.050	CR 99399
4.090	4.098	4.094	4.438	0.787	0.945	1.417	CR 99409
4.122	4.130	4.125	4.420	0.813	1.000	1.375	CR 99412
4.130	4.138	4.134	4.470	0.787	0.913	1.378	CR 99413
4.183	4.191	4.188	4.500	0.813	1.000	1.375	CR 99418
4.226	4.234	4.234	4.610	0.781	0.906	1.438	CR 99423
4.248	4.256	4.250	4.610	0.813	1.000	1.438	CR 99424
4.322	4.331	4.331	4.917	0.499	0.570	1.295	CR 99434
4.327	4.335	4.328	4.921	0.509	0.650	1.250	CR 99435
4.370	4.378	4.375	4.750	0.813	1.000	1.650	CR 99437
4.401	4.409	4.406	4.750	0.748	0.886	1.063	CR 99438
4.434	4.442	4.438	4.813	1.000	1.142	1.313	CR 99439
4.496	4.504	4.500	4.900	0.813	1.000	1.250	CR 99856*
		4.500	4.900	0.813	1.000	1.250	CR 99450
4.523	4.531	4.527	5.000	0.813	0.938	1.250	CR 99452
4.621	4.629	4.625	5.000	0.438	0.625	1.375	CR 99465
		4.625	5.063	1.000	1.250	1.375	CR 99463
4.685	4.693	4.688	5.063	0.813	1.000	1.375	CR 99468

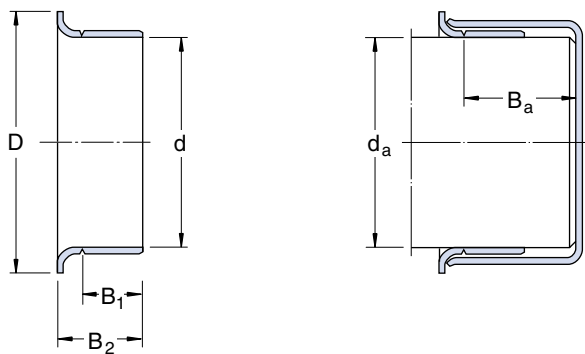
* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used

Shaft diameter		Sleeve Dimensions					Designation
d _a min	max	d	D ±0.063	B ₁ ±0.031	B ₂ ±0.31	B _a ¹⁾	
in		in					—
4.720	4.728	4.724 4.724	5.110 5.110	0.315 0.787	0.433 0.984	1.323 1.260	CR 99471 CR 99473
4.746	4.754	4.750	5.000	0.500	0.750	1.500	CR 99475
4.799	4.807	4.803	5.177	0.787	0.945	1.260	CR 99472
4.839	4.847	4.843	5.229	0.787	0.984	1.244	CR 99484
4.871	4.879	4.875	5.250	0.625	0.750	1.438	CR 99487
4.917	4.925	4.921 4.921	5.400 5.400	0.394 1.024	0.551 1.260	1.438 1.438	CR 99490 CR 99492
4.998	5.006	5.000 5.000 5.000 5.000 5.000	5.400 5.400 5.400 5.390 5.390	0.540 0.688 0.688 0.813 0.813	0.681 0.875 0.875 1.000 1.000	1.438 1.438 1.438 1.438 1.438	CR 99501 CR 99857* CR 99498 CR 99858* CR 99499
5.110	5.118	5.114	5.493	0.750	0.938	1.181	CR 99494
5.117	5.125	5.125	5.493	0.866	0.996	1.280	CR 99491
5.120	5.128	5.125	5.500	0.813	1.000	1.250	CR 99513
5.246	5.254	5.250	5.560	0.813	1.000	1.250	CR 99525
5.307	5.315	5.313	5.875	0.807	1.000	1.250	CR 99533
5.371	5.379	5.375	5.875	0.813	1.000	1.250	CR 99537
5.434	5.442	5.438	5.750	1.500	1.688	1.875	CR 99548
5.472	5.480	5.472	6.100	0.563	0.750	0.938	CR 99547
5.498	5.506	5.500 5.500 5.500	5.938 5.938 5.938	0.518 0.813 0.813	0.705 1.000 1.000	1.250 1.250 1.250	CR 99550 CR 99859* CR 99549
5.508	5.516	5.512	5.945	0.807	1.000	1.250	CR 99552
5.621	5.629	5.625	6.188	0.875	1.000	1.812	CR 99560
5.700	5.709	5.709	5.902	0.768	0.874	1.811	CR 99571
5.726	5.734	5.734	5.900	0.563	0.750	1.938	CR 99562
5.746	5.754	5.750	6.180	0.813	1.000	1.750	CR 99575

* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used



Shaft diameter		Sleeve Dimensions					Designation
d_a min	max	d	D ± 0.063	B_1 ± 0.031	B_2 ± 0.031	B_a ¹⁾	
in		in					—
5.871	5.879	5.875	6.188	1.000	1.250	1.313	CR 99862*
		5.875	6.188	1.000	1.250	1.313	CR 99587
5.895	5.905	5.905	6.260	1.024	1.181	1.338	CR 99595
5.934	5.942	5.938	6.375	1.000	1.125	1.875	CR 99596
5.995	6.003	6.000	6.360	0.500	0.750	1.750	CR 99601
		6.000	6.375	1.000	1.250	1.750	CR 99599
6.058	6.068	6.063	6.375	1.024	1.181	1.299	CR 99605
6.092	6.102	6.097	6.575	1.024	1.181	1.299	CR 99606
6.198	6.208	6.203	6.625	0.813	1.063	1.750	CR 99620
6.245	6.255	6.250	6.625	1.031	1.250	1.750	CR 99625
6.289	6.299	6.299	7.000	1.000	1.250	1.375	CR 99630
6.495	6.505	6.500	7.000	1.000	1.250	1.375	CR 99650
6.683	6.693	6.688	7.188	1.250	1.496	1.750	CR 99640
6.745	6.755	6.750	7.125	0.813	1.063	1.750	CR 99675
6.880	6.890	6.890	7.362	1.102	1.260	1.378	CR 99687
6.995	7.005	7.000	7.475	1.000	1.250	1.688	CR 99700
7.077	7.087	7.087	7.500	1.300	1.496	1.752	CR 99721
7.244	7.254	7.250	7.760	1.250	1.500	2.175	CR 99725
7.273	7.283	7.278	7.834	1.260	1.496	2.165	CR 99726
7.444	7.454	7.453	7.860	0.813	1.000	1.250	CR 99745
7.495	7.505	7.500	7.875	0.813	1.000	1.250	CR 99750
7.745	7.755	7.750	8.270	1.000	1.313	1.875	CR 99775
7.869	7.879	7.875	8.375	1.359	1.500	1.750	CR 99787
7.933	7.943	7.938	8.375	1.000	1.250	1.750	CR 99799
7.995	8.005	8.000	8.375	1.000	1.250	1.750	CR 99800

* Indicates Speedi-Sleeve Gold

¹⁾ Possible max. distance of rear groove from shaft end when installation tool supplied with sleeve is used

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Publication **5149 E** · June 2002

Printed in Sweden